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The Control of Deviant Sexual Behavior by Drugs: A Double-Blind Controlled Study of Benperidol, Chlorpromazine, and Placebo

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A method for assessing the effect of drugs on sexual drive and arousability has been developed and used to compare the effect of a butyrephenone, benperidol, with chlorpromazine and placebo. Measures of change used included sexual behavior ratings, self-ratings of frequency of sexual thoughts, semantic differential ratings, and penile erections to erotic fantasy, slides, and film. The study involved 12 pedophiliac sexual offenders. Results showed no significant difference between benperidol and the other two drug conditions, except in the self-rating of frequency of sexual thoughts, which was lower on benperidol. The libido-reducing effects of benperidol are therefore presumed to be weak and unlikely to be sufficient to control serious antisocial sexual behavior. The research method is suitable for assessing the effects of other drugs or hormones on sexual behavior.

INTRODUCTION

The treatment of sex offenders presents many difficulties. The probability of a sex offender convicted of an offense for the first time being convicted of a further offense is very small (Radzinowicz, 1957), so that the prognosis for this group will be good whatever the treatment. There is, however, an important proportion of cases where offenses are repeated or are of an exceedingly grave

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nature. Recidivist sex offenders attract long prison sentences, and some of them may be placed in special hospitals. Problems arise with this group in evaluating the most appropriate form of treatment and in assessing the effectiveness of whatever treatment is given.

Psychological treatment to produce a more normal pattern of sexual behavior is of value in only a small proportion of cases, and currently more reliance is being placed on methods which aim to reduce sexual drive.

Castration (a subject of academic interest only, in this country, as it is not permitted by law) is probably not justified because of its irreversibility and unpredictable results, a number of writers having observed that castration is not necessarily followed by loss of libido (Rowe and Lawrence, 1928; Bierer and Van Someren, 1950). Estrogens have been widely used (Golla and Hodge, 1949; Whittaker, 1959; Scott, 1964) and appear to be particularly effective where the behavior pattern is primarily a sexual response. Side-effects, such as nausea, vomiting, and feminization, are often a problem in the management of these cases, but new interest has been stimulated by the work of Field and Williams (1970) using estradiol implants. Recently, cyproterone acetate, an antiandrogen, has been described as a potent libido-reducing agent (Laschet and Laschet, 1969; Briggs and Briggs, 1971; Cooper *et al.*, 1972). A number of tranquilizers have also been reported as lowering sexual drive, in particular thioridazine (Litkey and Feniczy, 1967; Bartholomew, 1964), fluphenazine enanthate (Bartholomew, 1964), and recently a new butyrophenone, benperidol (Sterkmans and Geerts, 1966; Field, 1971).

Sturup (1968), among others, has attempted to assess the effectiveness of castration as measured by re-offending, and Field and Williams (1970) the effectiveness of estradiol by a followup study. Although it can be argued that the final test of effectiveness is in the subsequent behavior of the individual, there is a need for a more thorough assessment method which could be used prior to release. Such assessment presents methodological difficulties. Transient changes in sexual behavior may follow the use of many drugs, particularly when such an effect is anticipated by the subject. Subjective reports must be suspect, too, particularly with sex offenders who may be highly motivated to conceal certain aspects of their behavior or interests. This study describes an attempt to establish a method for the assessment of drugs affecting sexual drive and the use of this method to assess the efficacy of benperidol.

The requirements for such an assessment are as follows:

1. A double-blind comparison of the drug in question with a placebo and a control drug not expected to produce libido-reducing effects, but producing similar side-effects, particularly drowsiness and extrapyramidal effects. Chlorpromazine was chosen as the most suitable drug, as according to

the manufacturers its side-effects are more similar to those of benperidol than are those of any other major tranquilizer (Bobon *et al.*, 1966).

2. Measures of change relevant to the deviant sexual behavior and not entirely dependent on the subject's reports.

This report will be confined to describing the methods used and the results of the comparison between benperidol, chlorpromazine, and placebo.

METHOD

Measures of Change

The most relevant change is in deviant sexual behavior. The population studied is one compulsorily detained in one of the special hospitals, and, although this provides certain advantages, it does mean that there will be no opportunities for the deviant behavior which brought the subjects into the hospital. Masturbation and occasional homosexual contacts with other patients provide the only sexual outlet. Therefore, other variables relevant to sexual behavior need to be measured.

In previous research on the modification of sexual behavior (Marks and Gelder, 1967; Bancroft and Marks, 1968; Marks *et al.*, 1970; Bancroft, 1971a,b), a combination of different measures has been found to be the most effective. These have involved (1) ratings of overt sexual behavior (e.g., masturbation); (2) ratings of sexual fantasies (Bancroft, 1969); (3) measurement of sexual attitudes using the semantic differential (Marks and Sartorius, 1968); (4) measurements of physiological responses to sexual stimuli (fantasies or pictures), in particular penile erection measured by means of penis plethysmography (Bancroft *et al.*, 1966). Each of these measures alone would present serious shortcomings (Bancroft, 1971a,b) but when they are combined such problems are largely reduced.

Details of Measures

Sexual Behavior and Fantasies

Sexual Interest Score. Each subject was asked to indicate the frequency of his sexual thoughts on a scale from 0 to 5 (see Fig. 1).

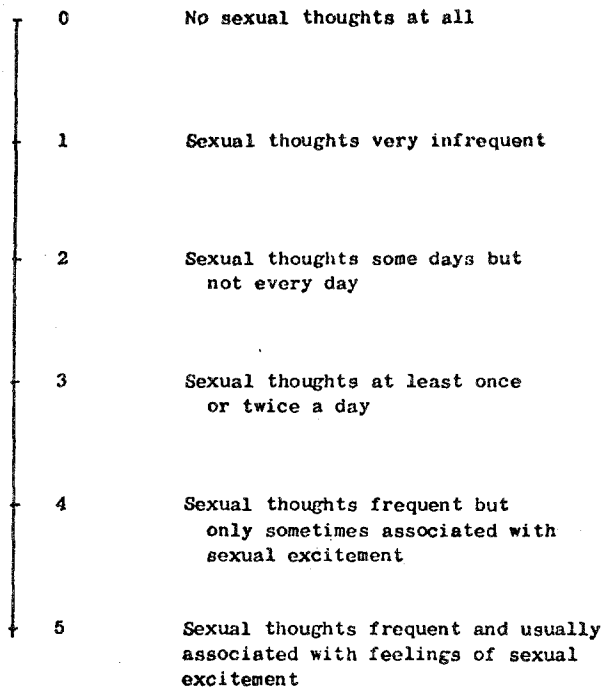

Fig. 1. Frequency of sexual thoughts. Subject was requested to mark the line in the appropriate place. Marking between numbers was acceptable.

Sexual Activity Score. The frequency of masturbation and any overt sexual acts were counted, each event scoring 1 point.

Sexual Attitudes

The semantic differential technique developed for sexual attitudes (Marks and Sartorius, 1968) was used. In each case, eight sexual concepts were rated, six involving deviant behavior, two normal behavior. The deviant concepts may have been either homosexual or heterosexual according to the nature of the subject's predominant tendencies (e.g., homosexual or heterosexual pedophilia). Examples of homosexual deviant concepts are "an attractive boy," "sex with an attractive boy," "undressing a young boy," "playing with a young boy's penis." Examples of deviant heterosexual concepts are "sex with an attractive young girl," "kissing the genitalia of an attractive young girl." Four scales were used to make up the sexual attitude score. These were seductive-repulsive, sexless-sexy, exciting-dull, frigid-erotic. As usual, a 7-point scale was used, the score of 1

indicating maximum positive attitude on that scale, the score of 7 maximum negative attitude, with 4 as a neutral point. The sum of the four scores was analyzed, giving a neutral score of 16 and a maximum positive score of 4.

Physiological Measures

Erections were measured to three types of erotic stimuli: fantasy, slides of attractive sexual partners, and a pornographic film. Erections were measured by means of a mercury and rubber strain gauge (Bancroft *et al.*, 1966) and changes recorded on a Theratronic H/4 polygraph. The strain gauge formed one arm of a Wheatstone bridge which was connected to a DC amplifier. The gauge was calibrated by inserting discs of a known diameter into the rubber loop and recording the resultant pen deflection, the sensitivity being adjusted so as to record 5 mm of pen deflection for every 1 mm increase in penis diameter. During the testing, patients sat in front of a screen in a darkened room. The experimenter and recording equipment were in an adjacent room.

Details of the stimuli are as follows:

Fantasy. Two fantasies were chosen of special relevance to each patient. The patient would be asked to imagine the fantasy in as vivid a way as possible and to sustain the fantasy during a trial lasting 3 min.

Slides. Six pictures were chosen by the patient from a large collection of photographs, and these were then made into slides. Two slides from this set of six were shown on each occasion. The subject was asked to look at the slide and to imagine himself in a sexual situation with the person in the slide and to maintain this fantasy for 2 min in each case.

Film. An extract of a pornographic film was shown, lasting for 4 min. The patient was asked to simply watch the film. Two films were used during the study, one involving homosexual activity, the other involving typical heterosexual activity. The heterosexual film was used when the pedophiliac behavior was of heterosexual type.

The order of presentation of the stimuli was the same in each session: two "fantasy" trials followed by two "slide" trials and finally the film. A minimum of 1 min would be left between each trial, and the next trial would not start until the level of erection had returned to baseline. The measurement taken was a maximum increase in erection during each trial as measured by the difference between the highest level reached and the lowest level preceding it during the trial.

Subjects

Fifteen patients volunteered to enter the study. It had been carefully explained to them that participation would not influence their release from the

Table I. Patients Treated

Patient	Age	Years in hospital	Most recent offense	Number of previous offenses	Age of victim	Sex of victim
1.	22	3½	Rape	3	4-13	Female
2.	46	5	Anal intercourse	6	8-16	Mainly male
3.	26	2½	Indecent assault	5	9	Male
4.	34	6	Anal intercourse	6	7-13	Male
5.	45	1½	Indecent assault	2	6-11	Male
6.	29	4½	Indecent assault	0	10-12	Male
7.	56	3	Anal intercourse	3	13	Male
8.	26	1 month	Anal intercourse	2	7-16	Male
9.	32	3½	Rape	2	13	Female
10.	26	3½	Indecent assault	2	9-10	Female
11.	37	1 month	Attempted anal intercourse	1	11	Male
12.	21	1 month	Attempted rape	5	7-13	Male and female

hospital. It was pointed out, however, that if the drug were found to be useful, it might help them when the time came for them to be released. All 15 volunteers then went through an initial testing procedure. For inclusion in the study, scope for change in the physiological measurement and one of the other two measurements was required. Arbitrary levels of sexual behavior ratings (for sexual interest a mean score of 3, for sexual activity a mean score of 3), of sexual attitude (a mean score of 12 or less), and of erectile response to erotic stimuli (a mean increase of 0.4 mm in penile diameter over the five trials) were used as criteria for inclusion. Thirteen of the 15 patients showed behavioral responses above these arbitrary levels, and the 12 with the highest responses were chosen. Two patients asked to withdraw during the first week, and a further patient became so severely depressed that it was decided to withdraw him from study. These three patients were replaced by three other volunteers, one from the initial testing and two others who were admitted subsequently. Details of the 12 subjects who were finally included are given in Table I.

Procedure

Drug treatment was started 3 days after initial testing. The sequence of the drugs (benperidol, chlorpromazine, and placebo) in each patient was allocated according to a balanced design (two Williams squares; Cochran and Cox, 1957).

Each drug was given for a 6-week period. The drugs were prepared and labeled in code by the drug company, the code being kept sealed by the pharma-

cist. Doctors and nurses involved did not know the code, and the trial was therefore double-blind.

Initially, liquid preparations were used (with standard dose 0.25 mg/5 ml) plus routine administration of orphenadrine tablets (with all three preparations including placebo). Due to intolerance to the syrup and difficulties in controlling the correct dosage, the liquid preparation was changed to tablets after the first 6-week period. The tablets were not recognizable. The dosage was as follows: Benperidol was given in an initial dosage of 0.25 mg b.d. for the first 5 days and then increased by 0.25 mg every 3 days until the patient was receiving a total of 1.25 mg daily from the fourteenth day onward. Chlorpromazine was given in an intial dosage of 25 mg b.d. for the first 5 days and then increased by 25 mg every 3 days until the patient was receiving a total of 125 mg daily from the fourteenth day onward. The placebo was given with increments similar to those for the other two treatments.

Measurement on all the variables was carried out at the end of each 6-week period. The sexual interest and sexual behavioral ratings were estimated for each of the last 2 weeks, and the mean of these 2 weeks was used in the analysis. The semantic differential was administered during the last week, and the physiological testing was carried out during the last 2 or 3 days.

RESULTS

The mean scores for the 12 patients for each of the variables for each of the drug treatments are given in Table II, together with the mean score for the initial testing.

Table II. Group Mean Scores

Measure	Initial testing	Placebo	Chlorpromazine	Benperidol	F ratio (df 2,22)
Sexual interest self-rating score (0-5)	3.25	2.34	2.65	1.73	$F = 5.67$ $p<0.025$
Sexual activity score (frequency count)	5.38	2.33	3.17	1.33	$F = 2.5$ N.S.
Sexual attitude score	6.97	8.76	7.09	9.99	$F = 5.1$ $p<0.025$
Erections to fantasy and slide (combined) (mm/increase/diam)	2.18	2.15	2.10	1.53	$F<1.0$ N.S.
Erections to film (mm/increase/diam)	4.0	4.37	5.58	5.35	$F<1.0$ N.S.

Table III. Orthogonal Comparisons of Drug Conditions

	Sexual interest self-rating	Sexual attitude
Benperidol and chlorpromazine plus placebo combined	$F = 28.81$ $p<0.01$	$F = 6.86$ N.S.
Chlorpromazine plus placebo	$F = 1.25$ N.S.	$F = 3.35$ N.S.

The three sets of scores for each variable were subjected to an analysis of variance. The initial pretreatment scores were not included in the analysis as order effect could not be discounted. When a significant F ratio was found, the difference between means was tested by orthogonal comparisons (Winer, 1962) (Table III).

A significant difference between drugs was found in the sexual interest self-ratings and the sexual attitudes scores. However, only in the sexual interest self-ratings was benperidol significantly more effective than both placebo and chlorpromazine, which were not significantly different from each other.

It is not possible to draw any definite conclusions about the presence of a placebo effect in this study. For this purpose, it would be necessary to have included a fourth "no-treatment" condition into the balanced design, which was impractical. However, a "no-treatment" period was included between the first and second drug conditions in each case, becoming necessary when changing from liquid to tablet preparations as suitable tablets were not immediately available. This enabled a comparison between the pretreatment measures and those

Table IV. Comparison of Pretreatment and No Treatment Periods

	Pretreatment	No treatment	Difference
Sexual interest self-rating	3.25	2.59	$t = 1.492$ N.S.
Sexual activity score	5.37	3.75	$t = 0.987$ N.S.
Sexual attitude score	6.97	8.75	$t = 0.987$ N.S.
Erection to fantasy and slide	2.18	2.94	$t = 1.432$ N.S.
Erection to film	4.01	5.23	$t = 0.37$ N.S.

Table V. Comparison of Pretreatment and Placebo–Group Means

	Pretreatment	Placebo	Difference
Sexual interest self-rating	3.25	2.34	$t = 1.586$ N.S.
Sexual activity score	5.75	2.33	$t = 1.714$ N.S.
Sexual attitude score	6.97	8.76	$t = 1.255$ N.S.

carried out in the later "no-treatment" period. The comparison is shown in Table IV. None of the differences is significant, although all three subjective measures were lower (or more negative) and the physiological measures higher on the second occasion. This latter difference may have been due to the subjects' overcoming the inhibition of the initial testing procedure.

If a placebo effect were operating, then one would expect a mush greater difference between placebo and pretreatment measures than between no-treatment and pretreatment measures. In fact, as shown in Table V, the differences are very similar. Within the limits of this design, therefore, no evidence of placebo effect has been demonstrated.

Table VI. Side-Effects[a]

	Drowsiness			Extrapyramidal			Others		
Patient	PL	CPZ	BP	PL	CPZ	BP	PL	CPZ	BP
1.		+				++	+	+	
2.		+				++	+	+	
3.		+	+						
4.			++			+		+	
5.									
6.					++	++			
7.		+	+						
8.	+					++	+		+
9.	+	+	++			++			
10.	++	++	+						
11.						++		+	++
12.	+			+	+	++			+

[a] All extrapyramidal side-effects were of dyskinetic type (except one placebo case which involved slight tremor). Miscellaneous side-effects included blurred vision (1 PL, 1 CPZ, 1 BP), photosensitivity (1 PL, 1 CPZ, 1 BP), dry mouth (1 PL, 1 CPZ), impaired exercise tolerance (1 CPZ).

Side-Effects

The severity of side-effects was not systematically assessed, but patients' reports were recorded (Table VI). In some cases, side-effects were sufficiently severe either to present a transient marked disturbance or, if prolonged, to require increase in orphenadrine.

DISCUSSION

The evidence suggests that benperidol does have a libido-reducing effect, but this is weak and has only been convincingly demonstrated in terms of the reported frequency of sexual thoughts. This raises the possibility that it is the fantasy aspect of sexual behavior that is mainly affected, whereas in the presence of an effective external (i.e., visual) erotic stimulus sexual arousability is not affected.

Because of this possibility, the physiological data were again examined to see if the response to erotic fantasies was more affected than the response to slides. A 2 X 2 analysis of variance was carried out to measure the interaction between drugs (placebo and benperidol) and type of stimulus (fantasy or slide), but there was no significant interaction ($F<1.0$). The hypothesis of specific effect on sexual fantasies is not therefore supported.

A further possibility is that tranquilizer drugs may affect sexual fantasy simply by impairing concentration. Table VI suggests that this is not likely to be due to drowsiness, which was as frequent with chlorpromazine as with benperidol. Dyskinetic effects were reported more frequently with benperidol, and concentration is often impaired in association with this type of motor restlessness. This is a possible mechanism which deserves further consideration.

In conclusion, this evidence suggests that the effects of benperidol are unlikely to be sufficient to control severe forms of antisocial sexually deviant behavior but may be of value in some cases where simple reduction in the frequency of sexual thoughts would be beneficial.

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